



Helena Forde, del. et lith.

AUSTRALIAN WATER-RATS.
(HYDROMYS CHRYSOGASTER.) (HYDROMYS LEUCOGASTER.)

From a photograph by Victor G. Prouz

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Golden-bellied and White-bellied Beaver Rat.

(HYDROMYS CHRYSOGASTER AND HYDROMYS LEUCOGASTER.)

It is a strange fact that Beaver Rats have not yet been found beyond the Australian region, though they appear well adapted to lead an aquatic life, and seem able to cross the narrow straits dividing the mainland from New Guinea and the various groups of islands not strictly Australian. Whatever may be the cause, however, they do not inhabit other parts of the World, and are as peculiar to our Country as the Kangaroo.

These rats have their grinders reduced to a pair in each ramus, above and below, and differ therefore from all other Rodents. It is difficult to determine how many species there are, and we believe that the four or five which naturalists choose to class as distinct, on account of a difference in fur, are in reality mere varieties of one kind.

We have selected two well-marked species for representation,—the one bright orange, the other dirty white, beneath; the upper parts are much alike, and of a grizzly brown or black colour. The tip of the tail is white in all species but one—Macleay's Beaver Rat (*Hydromys turilla*).

Two kinds are considered particularly doubtful, namely, the Fulvous Beaver Rat (*Hydromys fulvolavatus*), from the Murray River, and the Sooty Beaver Rat (*Hydromys fuliginosus*), from West Australia. The western animal is known to the aborigines of Perth as *Ngoör-joo*, whilst those who inhabit the country near King George's Sound call it *Ngow'-ir-ri-gin*. A third species was discovered by the late Mr. W. S. MacLeay, in front of his residence at Elizabeth Bay. This last rat has a uniformly dark tail, and is smaller than the others; but it is probably only an immature *Hydromys leucogaster*. The original specimen in the Australian Museum has lost much of the fur, and its characteristics cannot be described with that certainty which is desirable when new species are under discussion.

Beaver Rats are found in almost every part of Australia where there is permanent water; they become rare towards the tropics, and occur in large numbers in the southern streams and lagoons; are shy and nocturnal in their habits; dive well, but are soon drowned when unable to find a resting-place in the water. We have frequently tried the experiment in a large tank, and found them succumb in less than an hour. This fact may throw some light on the limited distribution of the genus. Their food consists of crustaceans, fish, and water insects, but principally of a small bivalve of the genus *Cyclas*, which our talented artist, Mrs. Forde, informs us is to be found in the rivers of the interior in such large quantities that refuse-heaps of the empty shells always line the banks. The number of young is four at a litter, and the mother provides a burrow in the river-bank for them. The young ones are often feasted upon by snakes, and in one instance a dozen of them were taken from the stomach of a single reptile.

The bone caverns of this Country, which have been most carefully examined, did not yield remains of these curious animals, though they have afforded proof that the Terrestrial and Arboreal Rodents lived in large numbers at a former age. It is not possible to add descriptions in this paper of the numerous rats and mice that inhabit Australia; but we furnish a list of all the supposed species, which may be found interesting. When more consideration is devoted by describing authors to teeth and structure of skeleton, and less to colour and texture of fur, these numerous species will suffer a heavy reduction, because one half of them are, no doubt, immature specimens, or local varieties.

The dentition of the genus *Hydromys* is as follows:—Incisors $\frac{2}{2}$, molars $\frac{2-2}{2-2} = 12$ teeth. All other Australian rats and mice have—Incisors $\frac{2}{2}$, molars $\frac{3-3}{3-3} = 16$ teeth.

The Rodents, Gnawers, or Rats, of Australia are conveniently divided into three groups, which we name—1st, the genus *Hydromys*, comprising the water rats just enumerated; 2nd, the genus *Hapalotis*, or the slender-eared and long-tailed rats; and, 3rd, the genus *Mus*, comprising the ordinary rats and mice.

GENUS HAPALOTIS.

(a.) Tree Rats, representing the Squirrels in Australia; tail long, and generally pencilled at the tip:—

1. White-footed Tree Rat. *Hapalotis albipes*. New South Wales.
2. White-tipped Tree Rat. *Hapalotis apicalis*. New South Wales.
3. Black-tipped Tree Rat. *Hapalotis penicillata*. North Australia.

4. Elsey's Hapalotis, or Tree Rat. *Hapalotis hemileucura*. North Australia.
5. Great Hapalotis, or Tree Rat. *Hapalotis hirsutus*. North Australia.
6. Spotted-tailed Tree Rat.* *Hapalotis* (or *Mus*) *macropus*. North Australia.
7. Building Hapalotis. *Hapalotis conditor*. This curious rat was first discovered by the late Captain Sturt, on the Murray and Darling, and the gallant explorer gives the following description of it:—"The Building Rat inhabits the brushes of the Darling, but was not found beyond latitude 30°. It builds a nest of small sticks, varying in length from three to eight inches, and in thickness from that of a quill to that of the thumb, arranged in a most systematic manner, so as to form a compact cone, like a bee-hive, about four feet in diameter and three feet high. Those at the foundation are so disposed as to form a compact flooring, and the entire fabric is so firm as almost to defy destruction, except by fire. The animal, which is like an ordinary rat, only that it has longer ears, and the hind-feet are disproportioned to the fore-feet, lives in communities, and traverses the mound by means of passages leading into the apartments in the centre. One of these nests or mounds had five holes or entrances at the base, nearly equidistant from each other, with passages leading from them to a hole in the ground beneath, in which I am led to conclude they had their store. There were two nests of grass in the centre, with passages running up to them diagonally from the bottom; the nests were close together, but in separate compartments, with passages communicating from the one to the other." Many years have passed since the gallant Captain explored these regions. Then only fleet-footed Wallabies disturbed the Building Rat; now herds of cattle tramp heavily over the country, and the little architect has been obliged to quit his dwelling, which is however often reoccupied by another rat—the White-tipped Hapalotis. We have had an opportunity of examining many of the curious structures described above; but out of at least fifty, only one contained a solitary "Köhl,"—the aboriginal name for the Building Rat. The nests so examined were not empty, but, as already stated, they frequently harboured a family of the White-tipped Hapalotis, a smaller and very gentle species—so gentle indeed as to be encouraged to share our frugal meals when we have been encamped for a few months near their habitations.

The Building Rat has large slender ears, and not a pencilled tail; it may belong to another section, but it is enumerated here for want of a better place at present.

- (b.) Jerboa-like Rats. Two distinct species of jumping mice inhabit Australia; the larger is found on the West Coast, and the smaller on the Murray and Darling. These mice or rats progress on their hind legs, like the Kangaroo. They form burrows in the sandhills, which the aborigines soon find out and trace to the very end, for the purpose of obtaining the inhabitants to roast them, when they cannot procure larger game:—
8. Long-tailed Jerboa. *Hapalotis longicaudata*. "Kor-tung" and "Gool-a-wa" of the aborigines of Moore's River, Western Australia.
 9. Mitchell's Jerboa. *Hapalotis mitchellii*. "Kahlpèré" of the Murray natives; "Djir-dow-in" of the aborigines near Perth; "Mat-tee-getch" of the Moore's River tribes.

GENUS MUS.

The common rats of Australia, that is, species with moderate ears and tails, are numerous, and difficult to classify. We enumerate them as follows:—

- Dusky-footed Rat. (*Mus fuscipes*.) Western Australia, South Australia, Islands of Bass's Straits, New South Wales, and probably Tasmania.
- Tawny Rat. (*Mus vellerosus*.) A long-haired species, from South Australia. Only one specimen in existence.
- Long-haired Rat. (*Mus longipilis*.) Probably identical with the above. A single specimen in the Australian Museum, from the Victoria River.
- Buff-footed Rat. (*Mus cervinipes*.) A Queensland and New South Wales species, named "Corrill" by the aborigines of Stradbroke Island, Moreton Bay, and "Cunduov" by the Richmond River natives.
- Allied Rat. (*Mus assimilis*.) "Moor-deet" of the King George's Sound tribes.
- White-footed Rat. (*Mus manicatus*.) An allied species, from Port Essington.
- Sordid Rat. (*Mus sordidus*.) "Dil-pea" of the aborigines of the Darling Downs District, New South Wales.
- Plain Rat. (*Mus lineolatus*.) "Yar-lie" of the aborigines of the Darling Downs.
- Gould's Rat. (*Mus gouldi*.) "Kurn-dyne" of the aborigines of Moore's River, West Australia.
- Little Rat. (*Mus nanus*.) "Jib-beetch"—aborigines of Moore's River, West Australia.
- Greyish-white Mouse. (*Mus albocinereus*.) "Noö-jee"—aborigines of West Australia, Perth District; "Jüp-pert"—aborigines of Moore's River, West Australia.
- New Holland Field Mouse. (*Mus nova-hollandiae*.) New South Wales.
- Delicate-coloured Mouse. (*Mus delicatulus*.) "Mo-lyne-be"—aborigines of Port Essington.

* This gigantic Rat has a more or less spotted tail, which is without a brush at the tip. It is a new discovery, and has been described as *Hapalotis caudimaculata* by Kreff, and under another name by Dr. Peters. It grows as large as the common Bandicoot—*Perameles nasuta*.